

WHAT IS CLAIMED IS:

1. A chemical-mechanical polishing proximity correction method for polishing a wafer having a polish area and a protected area thereon, comprising the steps of:

5 forming a material layer over the wafer to cover the polish area
and the protected area;
 forming a protective layer over the material layer; and
 patterning the protective layer so that the remaining portion of the
protective layer is at a distance away from the boundary of the polish area for
eliminating shadowing effects.

10 2. The proximity correction method of claim 1, wherein before forming the
material layer over the wafer, further comprises forming a plurality of device structures
in the wafer within the polish area.

 3. The proximity correction method of claim 2, wherein the upper section of the
protective layer is higher than the top section of the device structures within the polish
15 area.

4. A chemical-mechanical polishing proximity correction method for polishing a
wafer at least having a polish area, wherein the polish area has a plurality of boundaries
and at least a corner, comprising the steps of:

 setting up a plurality of peripheral shadow areas outside the
20 boundaries of the polish area, wherein the peripheral shadow areas have a first width;
 setting up a corner shadow area outside the corner of the polish
area, wherein the corner shadow area has a second width such that the second width is
greater than the first width; and

setting up a protected area outside the peripheral shadow area and the corner shadow area.

5. The proximity correction method of claim 4, wherein the peripheral shadow areas have a first width between 1 ~ 20μm.

5 6. The proximity correction method of claim 4, wherein the corner within the polish area is a straight corner.

7. The proximity correction method of claim 6, wherein the step of setting up the corner shadow area outside the corner of the polish area further comprising setting the second width of the corner shadow area according to the following relation:

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$$W = A + D = A + (C / \sqrt{2}) = A + (B / 2)$$

where W is the second width,

A is the first width, wherein the first width is between 1 ~ 20μm,

C is the shortest distance between a line joining the end points of the outer edges of two neighboring peripheral shadow areas and the corner of the polish area,

15 B is the distance from a cross point between the aforementioned line and the boundary of the polish area to the corner, wherein B is between 0.5 ~ 5μm, and

D is the difference between the second width and the first width.

20 8. The proximity correction method of claim 5, wherein the step of providing the wafer with a polish area comprises:

providing a wafer, wherein the polish area of the wafer has at least a device structure; and

forming a material layer over the wafer to cover the device structure.

9. The proximity correction method of claim 8, wherein the top section of the material layer within the protected area is higher than the top section of the material layer within the polish area.

10. The proximity correction method of claim 8, wherein the step of setting up the protected area outside the peripheral shadow areas and the corner shadow area comprises:

forming a protective layer over the wafer to cover the material layer; and removing a portion of the protective layer so that the protective layer within the protected area is retained.

11. The proximity correction method of claim 10, wherein the top section of the protective layer is higher than the top section of the device structure within the polish area.

12. A correction pattern for a chemical-mechanical polishing proximity correct, comprising:

a polish area over a wafer, wherein the polish area has a plurality of boundaries and at least a corner;

a shadow area set up outside the polish area of the wafer, wherein the shadow area at least comprises:

a plurality of peripheral sections set up outside the boundaries of the polish area, wherein the peripheral sections have a first width; and

at least a corner section set up outside the corner of the polish area, wherein the corner section has a second width such that the second width is greater than the first width; and

a protective region set up outside the polish area and the shadow areas of the wafer.

13. The correction pattern of claim 12, wherein the peripheral sections have a first width between 1 ~ 20μm.

14. The correction pattern of claim 12, wherein the corner within the polish area is a straight corner.

15. The correction pattern of claim 14, wherein the second width of the corner shadow area is set according to the following relation:

$$W = A + D = A + (C / \sqrt{2}) = A + (B / 2)$$

where W is the second width,

A is the first width, wherein the first width is between 1 ~ 20μm,

C is the shortest distance between a line joining the end points of the outer edges of two neighboring peripheral shadow areas and the corner of the polish area,

B is the distance from a cross point between the aforementioned line and the boundary of the polish area to the corner, wherein B is between 0.5 ~ 5μm,

and

D is the difference between the second width and the first width.

16. The correction pattern of claim 12, wherein the polish area further comprises at least a device structure set up on the wafer.

17. The correction pattern of claim 16, wherein the polish area further comprises a material layer formed over the device structure.

18. The correction pattern of claim 17, wherein the protected area further comprises a protective layer formed over the material layer.

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